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the trip, *Melospiza m. inexpectata* and *Passerella i. altivagans*, were described in an earlier, preliminary paper, confined to descriptions of these races, the present report being a general account of the entire collection. The region visited, comprising adjoining portions of southern Alberta and British Columbia, includes parts of two very different faunal areas, and a study of the material collected is accordingly productive of many interesting and illuminating facts in regard to the manner of occurrence of certain of the species and sub-species encountered.

Among the critical comments the following seem to be of particular interest to Californian ornithologists: Breeding specimens of *Leucosticte t. tephrocotis* from this region are declared to be indistinguishable from birds from the California Sierras. *Zonotrichia leucophrys* and *Z. gambeli* are considered to be specifically distinct, as both were found breeding at the same locality, each retaining its distinctive characters, and no intergrades being found. *Junco hyemalis* and *Junco oreganus* are also believed to be distinct species, a conviction shared by the present reviewer, upon very similar evidence to that advanced by Mr. Riley. The Orange-crowned Warbler of the region is called *Vermivora celata celata*, Oberholser's *V. celata oreastera* not being recognized; similarly in treating the Myrtle Warbler (*Dendroica coronata*), McGregor's *D. coronata hooveri* is ignored. Robins collected, declared to be intermediate in characters between *Planesticus m. migratorius* and *P. m. propinquus*, are considered as "belonging undoubtedly to the form described as *Planesticus migratorius caurinus* Grinnell", but the name *migratorius* is used to designate them.

Specimens of *Wilsonia pusilla pusilla* were taken at a British Columbian locality, and *W. p. pileolata* at a point in Alberta, farther east, a peculiarity of distribution not explained or commented upon by the author.

The report contains a quantity of valuable and authoritative data from a little known region, and is a correspondingly welcome addition to the ornithological literature of the west.—H. S. SWARTH.

COLOR STANDARDS AND COLOR NOMENCLATURE. By ROBERT RIDGWAY. pp. (1-4); i-iv; 1-44; frontispiece; pls. I-III. Washington, D. C., 1912 [January 16, 1913]. Published by the author. Price \$8.20.

The names of colors as well as names of animals and plants need to be exact and stable. No scientific worker whose investigations necessitate the use of color names can fail keenly to realize both the indefiniteness of most color designations, and the lack of a standard of color values that in exactness and

systematic arrangement adequately meets the requirements of modern science. Most of the existing color manuals are very unsatisfactory in practical use, either from want of proper designations or sufficient number of colors, from clumsiness, or poor arrangement. Furthermore there is no correlation between them. The best one is Mr. Ridgway's previous color book, "Nomenclature of Colors for Naturalists", which, however, has long been out of print.

The present work, confessedly not a technical treatise on color, aims definitely to standardize colors and color names, and to provide an adequate nomenclature, with samples of color sufficient for all practical descriptive and other related purposes. To this task Mr. Ridgway brings a lifetime of experience as artist and zoologist, and twenty-five years' special study of the subject. That he has succeeded is evident from even a cursory examination of this book.

The text treats first of the plan of the work, including the classification and preparation of the colors, of the scales adopted, and their designation and arrangement on the plates. Under "Color Names" the selection of the terms adopted is discussed, and the almost ridiculous chaos of present color nomenclature is clearly shown. Under "Color Terms" our author defines some of the most important terms used in the literature of color. Then follow the tables of percentages adopted as the standards in the present work; a list of the actual pigments used in the preparation of the fundamental pure colors; and an alphabetical list of the colors represented on the plates, with their proper symbols. All the names of colors in the author's original "Nomenclature of Colors for Naturalists" have, for the purpose of perpetuating these standards, been adopted in this new book, and a list of such of these as are not represented on the plates is given, together with the symbols by which they may be designated. A list of some of the most important books on the subject of color completes the text.

The fifty-three plates constitute, of course, by far the most important part of the volume. The color samples, each 25 by 12.5 millimeters, are mounted on a background of neutral gray, which for this purpose has many advantages over a white page. They have been prepared with great care by an improved process which produces an even matt surface, much more satisfactory for comparisons than a smooth or glossy color; and also insures absolute uniformity throughout the entire edition of the book.

The colors are arranged on each plate in three vertical rows, each representing a certain hue, together with three tints (mixtures with definite percentages of white) and three

shades (mixtures with definite percentages of black), grading to white at the top and black at the bottom of each column. Every color has a name and also a symbol, consisting of a number and a letter, and the intermediates which do not appear on the plate have similar symbols. The color scheme is probably the simplest that can be devised for a really scientific arrangement, and seems to be eminently satisfactory. The six fundamental spectrum colors which are here accepted as standards have been permanently fixed by the determination of their wave lengths; so that at any future time, should necessity demand, they can be exactly reproduced. These wave-lengths, as given, should, however, have been carried out to another decimal point, to correspond with the other wave-lengths with which they are compared.

The first twelve plates contain the pure colors, i. e., the shades and tints of the thirty-six colors and hues into which the spectrum series is here divided. Twelve of the following fourteen plates reproduce the same series with the addition of 32 per cent of neutral gray; and the two interpolated plates, distinguished by asterisks after the color numbers, have blue and blue violet colors with a slightly different percentage of gray. Plates XXVII to XXXVIII represent the colors of the first twelve plates with the addition of 58 per cent of neutral gray; and the remaining plates show three series, with respectively 77, 90, and 95.5 per cent of neutral gray, but in these every other hue is omitted because too little different. On the last plate a series of neutral grays and one of carbon grays is also added. Altogether 1115 named colors are represented, not counting black and white, as against 198 in Mr. Ridgway's original "Nomenclature of Colors for Naturalists". Furthermore, by the use also of intermediates, a total of 6506 colors can be designated.

While "Color Standards and Color Nomenclature" is primarily intended for naturalists such as botanists, entomologists, herpetologists, conchologists, ornithologists, mammalogists, and the like, it should prove valuable, as well, to manufacturers and merchants in various lines of business.

It is not, we think, too much to say that this book is by far the most important contribution to the subject of color standardization that has ever seen light, and that its appearance marks an epoch in color nomenclature. That it will soon prove indispensable to scientists generally, we have no doubt; and its adoption will go far toward reforming the present unsatisfactory usage, and will bring nearer the millennium of clearness and definiteness and uniformity in color names.—HARRY C. OBERHOLSER.

INDEX TO PAPERS RELATING TO THE FOOD OF BIRDS IN THE PUBLICATIONS OF THE UNITED STATES DEPARTMENT OF AGRICULTURE, 1885-1911. By W. L. McATEE (U. S. Dept. of Agric., Bureau Biol. Surv., Bull. 43, January 9, 1913, pp. 1-69).

The most recent publication of the United States Bureau of Biological Survey is an "Index to papers relating to the food of birds." To the average reader this will doubtless prove an uninteresting bulletin and one which will soon find its way to a back shelf, there to remain untouched. To the teacher, to the student of birds, and to the research student, however, this bulletin will appeal and will soon become thumb worn. To one who continually searches for the index, which is too often lacking at the end of scientific books, the annotated one at hand strongly appeals.

With a little search, information which is interesting to everyone can be obtained. The introduction points out the fact that during the twenty-six and one-half years of the existence of the Biological Survey there have been published 131 documents relating to the food of birds. Notes on the economic status of no fewer than 401 species of native birds and 59 species of foreign or introduced birds are to be found in these publications. A computation made by the reviewer shows that in the first 39 bulletins alone, over 2500 pages have been devoted almost exclusively to discussions of the economic aspects of ornithology.

When people become fully aware of the economic value of bird life there will certainly redound to the Biological Survey the credit of having insistently pointed out the interaction existing between organisms, and the consequent importance of preserving our native birds. A knowledge of the economic value of a bird assures its protection. As this value is largely dependent upon what the bird eats, the spreading broadcast of dependable evidence as to the food of birds is all important as a means of assuring needed protection for them.

Many readers may also fail to appreciate the work of the author in the preparation of the index. Sixty-seven pages of index and annotated bibliography do not appear on the surface to represent a great amount of labor. However, compilation of this kind costs a great many long hours of tedious work and the proof-reading of this type of publication must be considered the most difficult next to that of tables.

Mr. McAtee has given us a useful bulletin that will, at least, be appreciated by all those who have occasion to work in this field.—H. C. BRYANT.